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Procedia - Social and Behavioral Sciences 65 (2012) 247 – 252

Procedia
Social and Behavioral Sciences

International Congress on Interdisciplinary Business and Social Science 2012

(ICIBSoS 2012)

Behind the green doors: What management practices lead to sustainable innovation?

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Abstract

The notion of being green and competitive has gained substantial attention from both scholars and industry practitioners for the past few decades. It has been widely accepted that sustainable innovation (SI) is one approach that firms could adopt in becoming greener and yet competitive. Despite of this obsession, we know little of what firms are doing, or their practices that lead SI to take place in their organizations. This paper reviews some of management practices, pertaining to technology, human resources and external relationship practices that are significantly influential to SI. The insights forwarded by this paper could provide some basis for future studies in this domain, particularly regarding the role of top management; as well as the guidelines for practitioners to realize environmental transformation in their organization.

Keywords: Environment; green innovation; management practices; sustainable innovation; sustainability

1. Introduction

Sustainable innovation (referred as SI throughout this paper) has been the center of focus among businesses nowadays. With the rising awareness of environmental degradation throughout the globe, people are demanding for more environmentally sound products and services. This immense pressure not only forcing companies to be more ecologically sensitive; but it also offers a huge opportunity to innovate in a sustainable manner. Indeed, it is widely accepted that sustainable innovation (SI) is one approach that firms could adopt in becoming green and competitive. Not only firms could profit from being green, but

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doi:10.1016/j.sbspro.2012.11.118

the planet at large could preserve its natural resources for the future generations. This is evident in prior studies which reported that SI contributes to reductions in air emissions, resource consumption, and consumption of hazardous materials (Eltayeb, Suhaiza, & Ramayah, 2011; Halila, 2007. Theyel, 2000; Zhu, Sarkis, & Lai, 2007).Owing to these reasons, it is imperative to disseminate the knowledge regarding SI. We know from past studies that SI is driven by numerous factors such as regulation (i.e Berrone, Gelabert, Fosfuri, & Gomez-Mejia, 2007; Brunnermeier & Cohen, 2003), market demand (i.e Rehfeld et al., 2004; Zhu & Sarkis, 2007), and firm internal factors (i.e Chen, 2007; Neto & Jabbour, 2010; Ramus, 2002 & Theyel, 2000) . Yet, we lack of information regarding firm managerial aspects that could relate to SI, as studies mainly focus on economic related factors such as industry and national policy level (Schiederig, Tietze, & Herstatt, 2011). Indeed, management practices are believed to have a strong influence on the firm adoption of SI. This paper aims to explore further by asking the question: what management practices lead to sustainable innovation? The paper is organized as follows. Firstly, the concept of SI is explained, followed by the relationship between management practices and SI. In this section, practices that are influential to SI are discussed. The paper ends with insights gained from the review as well as direction for future works.

2. Sustainable innovation

Sustainable innovation is basically a marriage of two concepts. On one hand, it holds the idea of sustainability. The concept of sustainability has been formalized in the discussion on sustainable development back in 1987. Bruntland Report (1987) refers the concept as 'the ability of current generations to meet their needs without compromising the ability of future generations to meet theirs'. The core of mainstream sustainability thinking has become the idea of three dimensions; environmental, social and economic sustainability (Adams, 2006). Thus, it is indeed an interdisciplinary concept and has been used in various disciplines such as politics, economy, science and arts. On the other hand, innovation captures the concept of newness. Innovation is derived from the Latin word novus, which means 'new', and sometimes referred as 'new idea, method or device' or the process of introducing something new'(Rennings, 2000). OECD (1997) distinguishes innovation into three categories:

- Process innovation – occur when a given amount of output (goods, services) can be produced with less input
- Product innovation – improvements to existing goods (or services) or the development of new goods
- Organizational innovations- new forms of management, i.e. Total quality management

Merging the concept of sustainability into innovation is basically directing the innovation to include environmental concerns, so that it benefits both economic and environmental outcomes. OECD (2008) defines SI as all innovations that have a beneficial effect on the environment regardless of whether this was the main objective of the innovation. This means that it is the effects rather than intention that determine whether or not the innovation is sustainable (Halila, 2007). The term sustainable innovation also has been used interchangeably with other concepts such as Eco innovation, environmentally driven innovation and green innovation (Hordern, Borjesson, & Elmquist, 2008). Studies also show that firms that innovate in sustainable manner able to reap both economic and and environmental benefits (i.e . Chen 2006; Eltayeb, Suhaiza, & Ramayah, 2011; Theyel, 2000). Due to this reason, it is evident that SI should be promoted in business organizations. The next section will discuss how management practices could

promote the adoption of SI. For the purpose of this paper, two particular types of SI will be studied; which is an innovation in product and process.

3. Management practices and sustainable innovation

Studies in the past found a significant difference in firm practices between adopters and non adopters of SI (i.e. (Banerjee, Iyer, & Kashyap, 2003; Florida, et al., 2001; Theyel, 2000). These studies claim that the adopters are more inclined to exercise SI when their top management is environmentally oriented. That is, the recognition by managers of the importance of environmental issues facing their firms (Banerjee, et al., 2003). This awareness or recognition of its importance will eventually promote practices that could reduce environmental harms, such as SI. Review of literatures also suggests that the management practices for SI can generally be classified into three broad categories; they are practices that relate to technology, human resources and external relationship.

3.1 Practices related to technology

The first category is pertaining to firm's practices with regards to technology. These include R&D, policy of material selection, manufacturing process and the use of Life Cycle Analysis (LCA) for product design. Studies found that R&D is significantly related to SI. Theyel (2000) found in his study that, nearly one third of the sample plants rank R&D as the most important source of new ideas and technology for pollution prevention efforts. It has also been reported that firms that focus on their R&D are found to be more proactive as compared to their counterparts (Saa-Perez & Garcia-Falcon, 2002). This is because firms that are R&D oriented continuously improve their products to cope with current and future demand. Dedication to R&D indeed stems from top management who believe that SI is a worthy business strategy, apart from being socially responsible. Moreover, SI normally requires large investment in R&D. Hence, SI is more likely implemented when top management willing to commit resources to this activity (Pujari, Peattie, & Wright, 2004). Such resources also include LCA tool, which enables screening of environmental impacts of products at the earliest stage of the design. The use of LCA is also widely practice by firms that manufacture eco products (Dangelico & Pujari, 2010; Pujari, et al., 2004). Besides, firms that adopt SI also have policy concerning the use of unsustainable materials (Ramus, 2002). Thus, it guides the selection of material for products to be developed as well as alternatives in order to minimize the ecological footprint of the products. Finally, practice of constant reviewing of the manufacturing process is also associated with SI. This includes regular environmental inspections, using systematic control of the use of energy to reduce consumption, recycling the water used for reuse in other processes before discharge into the drainage system, use of reusable containers or packaging and filter the emissions and discharges from the manufacturing process (Azzone, Bianchi, Mauri, & Noci, 1997; Florida, et al., 2001; Paramanathan, Farrukh, Phaal, & Probert, 2004).

3.2 Practices related to human resources

It is believed that SI will be unrealistic without the support of human resources (Neto & Jabbour, 2010). A number of studies lend us support that wise management of human capital could be an important factor that influences environmental endeavor, such as SI. The practices include environmental training, employee involvement, open communication and the use of reward and appraisal system. Theyel (2000) found that companies who are leaders in environmental innovation widely practice environmental training and incentive programs to involve their employees in continuous innovation. Through training, the organizational capacities and knowledge of the workers are developed, thus employees could understand how the environment will affect and be affected by their duties and decisions (Sarkis, Gonzalez-Torre & Adenso-Diaz, 2010). This awareness and knowledge will be more significant when the employees are

empowered to initiate environmental practices, hence lead to SI implemented in the organization (Harjeet, 2011). Employee participation, on the other hand helps to change working routines, affecting behavior and increasing environmental consciousness (Remmen & Lorentzen, 2000). Formation of the green team promotes collective learning, which eventually helps to identify solutions or innovative ideas with regards to environmental issues across firm's operations (Neto & Jabbour, 2010). Besides, firms that practice open communication with employees are better able to encourage innovative ideas, as opposed to top down approach (Ramus, 2002). In addition, the use of reward system could motivate employees to find a solution to certain environmental issues, hence develop less polluting products (Ramus, 2002)

3.3 Practices related to external relationships

The way firms engage with its external stakeholders could also influence its environmental initiatives. Among external stakeholders that are influential to firms are regulators, customers, suppliers, competitors, media and environmental activists. According to Plaza-Úbeda, de Burgos-Jiménez, & Carmona-Moreno (2010), managing external relationships with stakeholders captures three dimensions; that is knowing their expectations, interact and adapt to their concerns. Henriques and Sadorsky (1999) reported that environmentally proactive firms are found to view all their stakeholders as important and actively manage their environmental concerns. Knowing the stakeholders and their concerns open rooms for firms bring in more voices in the innovation process (Ayuso, Rodríguez, García-Castro, & Ariño, 2011). Some studies also show that stakeholder pressures constitute the firm's prime motivation to adopt SI (Henriques & Sadorsky, 1999; Guoyou et al., 2011; Sarkis et al., 2010). Kammerer (2009) claims that understanding and integrating customer benefit in product development will generate stronger demand for green products, which in turn motivate firms to engage in SI. Moreover, customer and supplier relationships are essential factors that companies should consider when initiating SI, particularly when it comes to find environmental alternatives in materials, components and processes (Johansson, 2002). Pujari (2006) found a significant relationship between supplier engagement and environmental product development, and concluded that it would require consideration of the whole supply chain of materials and inputs required to make green products. Besides, engagement with non-business stakeholders such as the media and NGOs could also influence SI endeavor. Sponsoring of environmental events, disclosure of environmental reports and educate public on certain environmental issues are some mechanisms used by firms to indicate their environmental commitment to the society. Through these practices, firms gain reputation of conducting environmentally sound business, hence trigger more SI as to maintain their status (Ayuso et al., 2011; Plaza-Úbeda et al., 2010).

4. Conclusion

Despite the growing interest on SI, attention to managerial aspects which indeed one of the important factors remains limited. This paper aims to answer: what management practices lead to sustainable innovation? Accordingly, it identifies three main firm practices that could lead to SI adoption; classified as practices pertaining to technology, human resources and external relationship practices. This review is the first step towards establishing a framework of the relationship between firm practices and the adoption of SI. Empirical investigation of the mentioned relationship, however, is the agenda for future research. This paper contributes to knowledge by exploring the relevant practices that firms could adopt in triggering SI in their organization. At its core, it signifies the pivotal role of top management in enabling environmental transformation in their organization. Thus, insights forwarded by this paper present some guidelines to practitioners who wish to realize SI.

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